

Republic of Kenya



Busia County Government

BUSIA COUNTY BIODIVERSITY POLICY

(Our Heritage, our Strength and the Basis of our Development)

2016 - 2023

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Table of Contents

Foreword.....	iii
Preface	iv
List of Terms Used in the Policy	vi
CHAPTER ONE: INTRODUCTION	1
1.1 Background	1
1.1.1 Biological Diversity.....	1
1.1.2 Busia County	2
1.1.3 An overview of Biodiversity in Busia County	3
1.2 Busia County Biodiversity Policy Thrust.....	4
1.2.1 Policy Justification.....	4
1.2.2 Policy Vision	5
1.2.3 Policy Mission	5
1.2.4 Policy Objectives	5
1.2.5 Guiding Principles	6
CHAPTER TWO: STATUS OF BIODIVERSITY IN BUSIA	7
2.1 Plant Genetic Resources	7
2.2 Animal Genetic Resources	8
2.3 Aquatic Genetic Resources	10
2.4 Microbial Genetic Resources	11
2.4 Indigenous Knowledge and Practices	11
2.5 Socio-Economic Importance of Biodiversity	11
2.6 Institutions Engaged In Biodiversity Conservation	13
CHAPTER THREE: POLICY ISSUES, CHALLENGES AND INTERVENTIONS ON BIODIVERSITY MANAGEMENT.....	14
3.1 Challenges in the Management of Biodiversity	14
3.2 Policy Interventions	16
3.2.1 Enhancing County Biodiversity Conservation	17
3.2.2 Improving access to and ensuring equitable sharing of benefits accrued from utilization of biodiversity in Busia County.	18
3.2.3 Promoting Biodiversity Utilization to enhance nutrition and management of health related ailments.....	19
3.2.4 Promoting Biodiversity Research and Development	19
CHAPTER FOUR: POLICIES, STRATEGIES AND PLANS OF ACTIONS.....	20
4.1 Enhancing County Biodiversity Conservation	20

4.2 Improving access to and ensuring equitable sharing of benefits accrued from utilization of biodiversity in Busia County.	25
4.3 Promoting Biodiversity Utilization to enhance nutrition and management of health related ailments	26
4.4 Promoting Biodiversity Research and Development	26
CHAPTER FIVE: POLICY IMPLEMENTATION AND REVIEW	28
5.1 Institutional Framework for Policy Implementation.....	28
5.2 Resource Mobilization	29
5.3 Monitoring and Evaluation	29
ANNEXES	31
Annex I: Policy Implementation Framework.....	31

Foreword

The people and government of Busia, especially indigenous and local communities, rely on biodiversity for a variety of everyday purposes. We consider ourselves as custodians and protectors of our biological diversity. As a people, the Busia biodiversity is our heritage, our strength and the basis of our development.

In this regard we acknowledge the efforts put into the conservation, protection and wise use of biodiversity by our ancestors and forefathers. They have bequeathed us this heritage and ensured that the current resources are available in this county for our continued use now and for generations that will come after us. That biodiversity is critical for improved livelihoods and has the potential to significantly contribute to economic and socio-cultural benefits of communities and countries are indisputable.

It is in recognition of the critical role that our biodiversity can play in addressing food security of our people that the County Government partnered with the Kenya Agricultural and Livestock Research Organization, under the Biodiversity for Food and Nutrition Project, to develop The Busia County Biodiversity Policy.

Busia is a county that is very rich in genetic resources, associated traditional knowledge and varied ecosystems. This notwithstanding, the County continues to depend on food imports, has a high prevalence of child malnutrition and high unemployment rate. To gain from the available rich biodiversity, the county government of Busia undertakes to promote conservation and sustainable use of biodiversity while ensuring the fair and equitable sharing of benefits accrued from the utilization of the genetic resources.

This policy is the first among many measures of enabling the Busia County Government to play a greater role in the management of ecosystems, species and genetic diversity in a manner that is sustainable and beneficial to our people. The policy will allow for appropriate transfer of technology to this county. It will also enable formulation and adoption of legislation that will ensure our people and communities benefit from the rich biodiversity and associated traditional knowledge.

My government will endeavour to enhance the mainstreaming of biodiversity issues and incorporation of knowledge management systems into the county development plans, decision making processes. In addition, my government also endeavours to enhance the allocation of financial, human and material resources required to enable people to conserve, utilize and benefit from our biodiversity.

The future generations expect us to leave our environment and diversity richer than we found it. I therefore urge the key line departments that deal with natural resources to ensure the effective implementation of this policy for the benefit of the Busia County and its people.

H.E. Sospeter Ojaamong
Governor of Busia County

Preface

Countries which achieved major economic development made deliberate and strategic investments in conservation of their plant, animal, aquatic and microbial genetic resources, which constitutes biodiversity. More importantly, biodiversity plays a major role in the provision of food, medicinal resources, wood products, ornamental plants, sources of propagation stocks and thus should be zealously conserved as its loss, some of its components may not be possible to restore. Notably, indigenous knowledge and practices play a paramount role in biodiversity conservation signifying that the Busia county community is best placed to conserve its biodiversity. Conservation of biodiversity is not only important but also part of the sustainable development goals, which advocates for secure ecosystem services and biodiversity, ensure good management of marine and terrestrial ecosystems and natural resources of local, regional, and global significance. It calls for the resources to be inventoried and monitored to ensure the continuation of resilient and adaptive life support systems and to support sustainable development. This ensures that natural resources are managed sustainably and transparently to support inclusive economic and human development, which is vital for proper functioning of ecosystems.

Kenya being a signatory to several conventions and protocols related to Biodiversity, among them the Convention on Biological diversity (CBD) and its protocols, particularly the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS), conservation of biodiversity is not optional and thus Busia county takes a lead in conserving its biodiversity. This is because under the devolution governance initiative in Kenya, it is the mandate of each.

This policy addresses management of ecosystem, species and genetic diversity. The management will comprise: *in-situ* and *ex-situ* conservation of biodiversity, appropriate measures for access and sustainable use, appropriate mechanisms for the transfer of relevant technologies including biotechnology, protection of intellectual property rights over accessed genetic resources and associated knowledge, and provision of appropriate funding mechanisms. It endeavours to provide Busia County with a framework for biodiversity conservation, protection and promotion of sustainable use of genetic resources and associated traditional knowledge including cultural expressions, and equitable sharing of benefits accrued from this use. It will enhance mainstreaming of biodiversity issues and knowledge management systems into the County's development plans and decision making processes. Features in this

policy is the diverse biodiversity and the communities' rich cultural heritage. These include and are not limited to traditional literature, arts and crafts, music, visual arts, ceremonies, beliefs, architecture, knowledge related to traditional-medicines and practices, agriculture and forest

It is our hope that implementation of this policy will serve not only current but also future generations.

Hon. Dr. Moses Osia Mwanje

County Executive Committee Member for Agriculture and Animal Resources

Busia County

List of Terms Used in the Policy

Access: in relation to genetic resources, includes the collection, use and exploitation of those resources.

Access and benefit-sharing: refers to the way in which genetic resources may be accessed, and how users and providers reach agreement on the fair and equitable sharing of the benefits that might result from their use.

Associated traditional knowledge: knowledge which is dynamic and evolving, generated in a traditional context, collectively preserved and transmitted from generation to generation including but is not limited to knowhow, skills, innovations, practices and learning, that [subsist in] [that are associated with] genetic resources.

Biodiversity: Refers to the variability that exists among living organisms from all sources including among other things, terrestrial, marine and other aquatic ecosystems and the ecological complexes which they are part of. This includes diversity within species, between species and their ecosystems.

Biological resources: Includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Biopiracy: the unethical or unlawful appropriation or commercial exploitation of biological materials (such as medicinal plant extracts) that are native to a particular country or territory without providing fair financial compensation to the people or government of that country or territory

Bioprospecting: any research on, or development or application of, indigenous biological resources for commercial or industrial exploitation, and includes the systematic search, collection or gathering of such resources or making extractions from such resources.

Ex-situ conservation: is the conservation of components of biological diversity outside their natural habitats.

Genetic material: any material of plant, animal, microbial or other origin containing functional units of heredity.

Genetic resources: genetic material of actual or potential value.

In-situ conditions: are conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

Misappropriation: is the acquisition/utilization of genetic resources, their derivatives and/or associated traditional knowledge/traditional knowledge associated with genetic resources without the free/prior informed consent of those who are authorized to give such consent to such

acquisition/utilization, in accordance with national legislation of the country of origin or providing country.

Traditional knowledge in the context of access and benefit-sharing refers to the knowledge, innovations and practices of indigenous and local communities (ILCs) related to genetic resources. This traditional knowledge is developed through the experiences of communities over centuries, adapted to local needs, cultures and environments and passed down from generation to generation.

Traditional knowledge associated with genetic resources: any knowledge or innovation in relation to genetic resources and their use that constitute part of the common, traditional or customary patrimony of indigenous peoples and local communities.

Utilization: of Genetic Resources means to conduct research and development including commercialization on the genetic and/or biochemical composition of genetic resources, their derivatives and associated traditional knowledge/traditional knowledge associated with genetic resources including through the application of biotechnology as defined in Article 2 of the Convention on Biological Diversity.

CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 Biological Diversity

Biodiversity or biological diversity is the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic systems and the ecological complexes of which they are part. Biodiversity encompasses all variety of life forms at all levels of biological systems (i.e., genetic/molecular, species, organisms, population, and ecosystems). It includes diversity within species, between species and associated ecosystems.

The significance and contribution of biodiversity to improved human livelihoods and well-being has increasingly gained prominence and become clearer over the last few decades. The benefits that humans receive from the resources and the natural ecosystem services thereof (the 'ecosystem services' concept), can be measured based on different parameters one of which is the Millennium Ecosystem Assessment (MA 2005) that uses five different categories of ecosystem services:

- (i) Provisioning services such as food, water, timber, and fibre;
- (ii) Regulating services that affect climate, floods, disease, wastes, and water quality;
- (iii) Cultural services that provide recreational, aesthetic, and spiritual benefits; and
- (iv) Supporting services such as soil formation, photosynthesis, and nutrient cycling
- (v) Supporting science, research and education such as providing the genetic material by which breeders seek to isolate and improve plant varieties, animal breeds and greater understanding of nature.

Biodiversity is therefore critical for improved livelihood and has the potential, if properly managed, to significantly contribute to economic and socio-cultural benefits of communities and nations. In particular, the ability to use biodiversity to address global and national food security is immense. The link, for example, between genetic diversity and sustainable agriculture include ability to use genetic diversity as a basis for breeding of new crop varieties to meet a society's agricultural food and agricultural raw material needs and to deploy genetic variation in plant populations to reduce risk and increase overall production stability. In addition, biodiversity offers opportunities for diversifying food sources beyond the traditional crops and animals used by man for food.

The following three areas have been determined to be critical to the proper management of biodiversity;

- (i) Conservation of biodiversity
- (ii) Sustainable use of biodiversity components

- (iii) Fair and equitable sharing of benefits arising out of the utilization of genetic resources

Countries are interdependent to the extent that biodiversity is a common global heritage. Their benefits go beyond a country's borders, thus making their management a common concern of all countries. Enabling policy environment at national, regional and international levels is necessary for effective conservation, access and utilization of biodiversity including equitable sharing of benefits accruing thereof. It is with this recognition that a multiplicity of international legal instruments have been put in place to guide nations in this endeavour. The instruments include the Convention on Biological Diversity (CBD), International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), Nagoya Protocol, the Cartagena Protocol, the International Convention for the Protection of New Varieties of Plants (UPOV), the World Trade Organizations – Agreement on Trade Related Aspects of Intellectual Property Rights (WTO-TRIPS), Biological, Toxin and Weapons Convention (BTWC), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the World Conservation Union (IUCN), United Nations Framework Convention on Climate Change and the Convention on Wetlands of International Importance (RAMSAR Convention).

Kenya is a signatory to the above legal instruments and implements their provisions through various government-led agencies. These agencies include the National Environment Management Authority (NEMA), Kenya Wildlife Service (KWS), National Museums of Kenya (NMK), Kenya Forest Service (KFS), the Genetic Resources Research Institute (GeRRI), National Biosafety Authority (NBA), Kenya Plant Health Inspectorate Services (KEPHIS), Kenya Industrial Property Institute (KIPI) and National Commission for Science Technology and Innovation (NACOSTI). Part of the responsibilities of these lead agencies established under different legislations is the proper management of Kenya's biodiversity through effective conservation, utilization and sharing of benefits.

1.1.2 Busia County

Busia County is located on the western end of Kenya, bordering Uganda and covers an area of 1,694.5 Km². The County has seven sub-counties, 35 Wards, 60 locations and 181 sub-locations. Most parts of Busia County fall within the Lake Victoria Basin. The altitude is undulating and rises from about 1,130m above sea level on the shores of Lake Victoria to a maximum of about 1,500m in the Samia and North Teso Hills. The county is also served by rivers Malakisi to the extreme north, Malaba in the northern entry of the central region and River Sio in Funyula and Nambale Sub-counties. River Nzoia drains into Lake Victoria through Budalang'i Sub-county.

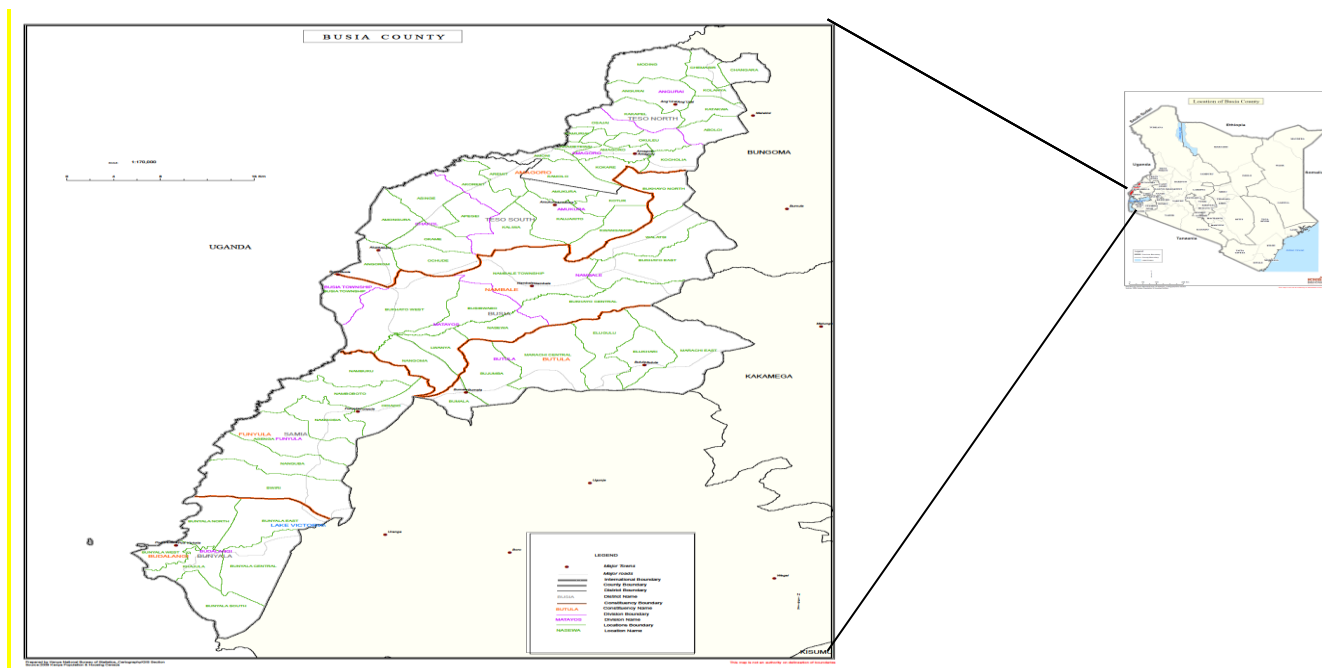


Fig. 1: Busia County Location and Administrative Units

1.1.3 An overview of Biodiversity in Busia County

Crops, livestock and fish production constitute the main economic activities of the people of Busia County. These are mainly carried out at subsistence level for local consumption, and only minimal for commercial purpose. The main type of crops grown in Busia County include: maize, cassava, finger millet, beans, sorghum, rice, sweet potato, cowpea, groundnuts, banana, green gram, sesame, soya beans, cotton, tobacco, sugarcane, oil palm, and pepper. There are also horticultural crops including pineapples, tomatoes, kales, cabbages, water melons, local vegetables, papaya, jack fruit, amaranth, onions and, mangoes, among others.

The main livestock in the county are zebu cattle, sheep, goats, pigs and free-range local chicken. Fish capture from Lake Victoria is the main fishing activity in the Budalang'i and Funyula Sub-counties. In addition, there is fish farming in the County with about 1500 fish ponds spread across the Sub-counties, where Tilapia and mud fish species are being farmed.

Busia County has a natural forest covering the hills of Samia and Budalang'i while other parts of the county have on-farm woodlots that have been integrated with agricultural farming. The County has two gazetted replanted forests mainly located in Budalang'i sub-county with an area of 528.8 Ha. The main forest products from the two types of forests include firewood and charcoal as fuel, medicinal plants, honey for commercial and domestic consumption, and timber for construction of houses. The commercial forests produce poles for sale to the Kenya Power Company; among others. These Forest Ecosystems provide goods in form of fruits, edible roots, tubers, berries, medicinal herbs/leaves, timber, firewood and fodder to both humans and animals. They also

provide ecosystem services such as pollination, absorption of CO₂ and nutrient recycling. Forests are also recipients and partial recyclers of waste products from the environment, in addition to being a source of recreation, beauty, spiritual values and other cultural amenities.

1.2 Busia County Biodiversity Policy Thrust

1.2.1 Policy Justification

Kenya is a signatory to several conventions and protocols related to Biodiversity, to which Busia County is also bound. Key among them is the Convention on Biological diversity (CBD), and its protocols, particularly the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS). The objectives of the CBD are the conservation of biological diversity, sustainable use of its components and the fair and equitable sharing of benefits arising from its utilization. The provisions of both the CBD and Nagoya Protocol are stipulated in the NEMA Legal Notice No. 160 of 2006 that governs the ABS; in addition, Kenya is also party to the FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). The Treaty provides facilitated access to genetic materials of global importance in food security. It also provides for protection of farmers' rights to use and exchange farm-saved seed. Biodiversity issues are very pertinent in trade and commerce, as envisaged in the Agreement on Trade Related aspects of Intellectual Property Rights, also known as TRIPS, to which Kenya is a party, and by extension Busia County as well.

The Constitution of Kenya 2010, in its Articles 11 on Culture, and 69 on Environment, among other relevant articles, provides an opportunity to mainstream issues related to culture, biodiversity and protection of communal and individual intellectual property rights in regard to planning for sustainable development. These issues are similarly pertinent to Busia as a County.

In regard to biodiversity in Busia County, the issue to be addressed by this policy is the management of ecosystem, species and genetic diversity. The management will comprise: *in-situ* and *ex-situ* conservation of biodiversity, appropriate measures for access and sustainable use, appropriate mechanisms for the transfer of relevant technologies including biotechnology, protection of intellectual property rights over accessed genetic resources and associated knowledge, and provision of appropriate funding mechanisms.

Busia County has diverse biodiversity and the communities have a very rich cultural heritage. These include traditional literature, arts and crafts, music, visual arts, ceremonies, traditional beliefs, traditional architecture associated with particular communities and sites. The rich culture also includes forms of traditional knowledge related to traditional-medicines and traditional-medical practices, agriculture and forest management practices. These interactions between man with the biotic and abiotic environment has resulted in beneficial cultural practices which for generations has supported livelihoods of the Busia County communities.

We are cognisant that communities possess their own locally-specific systems of jurisprudence. The systems are in respect to classification of different types of knowledge, proper procedures for acquiring and sharing knowledge and the rights and responsibilities attached to possessing knowledge. All these are embedded uniquely in each community and the ecosystem surrounding it.

It has also been observed that scientific and technological advances based on traditional knowledge and sound traditional understanding and management of biodiversity is on the rise. However, aspects of this advancement are being disseminated and commercially exploited without due recognition of the original owners of knowledge and ensuring equitable sharing of benefits thereof.

This Policy endeavours to provide a Busia County framework for biodiversity conservation, protection and promotion of sustainable use of genetic resources and associated traditional knowledge including cultural expressions, and equitable sharing of benefits accrued from this use. The Policy will enhance mainstreaming of biodiversity issues and knowledge management systems into the County's development plans and decision making processes.

1.2.2 Policy Vision

A rich and stable ecosystem providing benefits for all in Busia County.

1.2.3 Policy Mission

To restore and manage biodiversity, through community empowerment, and inclusive approaches.

1.2.4 Policy Objectives

(i) Overall Policy Objective

Management of Busia County biodiversity for sustainable development and improved livelihoods.

(ii) Specific Policy Objectives

1. To promote effective conservation and facilitate structured access to biodiversity resources and associated ecosystems.
2. Ensure equitable sharing of benefits accrued from utilization of biodiversity in Busia County
3. Enhance sustainable utilization of biodiversity for improved nutrition and livelihoods in Busia County.
4. Mainstreaming biodiversity research in county development planning and implementation in Busia County

1.2.5 Guiding Principles

1. We shall observe and respect international and national frameworks that guide the management of biodiversity.
2. Uphold county priorities as we endeavour to meet national obligations.
3. Encourage exploitation of local biodiversity resource within Busia.
4. Collaboration and partnerships that promote inclusivity and public participation.
5. Adhere to principles and practices of biosafety in the utilization of biological diversity.
6. Equitability in the sharing of benefits arising/accruing from utilization of biodiversity

CHAPTER TWO: STATUS OF BIODIVERSITY IN BUSIA

Biodiversity is the variety of life on earth. It is the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Busia is endowed with a diverse heritage of plant and animal genetic resources. These comprise of agricultural biological diversity, or agro-biodiversity, an essential component of biological diversity. Agro-biodiversity is necessary in sustaining key functions of any agro-ecosystem, its structure and processes. Agro-biodiversity supports food production, food and nutrition security and economic development initiatives. The various species of plants, animals, and microorganisms, constitute the enormous genetic diversity found in different ecosystems of Busia County. The ecosystems include: wetlands, farmlands, forests (natural and artificial), lake, rivers, streams, hills and valley bottoms. Cultures of the Busia people have their roots in this diversity in the form of food, traditional beliefs, housing and livelihoods sources. In addition, the rich diversity has been used for medical purposes, economic development, and adaptive responses to new challenges such as climate change.

2.1 Plant Genetic Resources

Busia County is well renowned for its wide range of biodiversity. The riverine ecosystems and their associated wetlands have a total 209 species of plants recorded belonging to 47 families and 151 genera. The dominant species in these ecosystems are *Cyperus papyrus*, *C. latifolius* and *Phragmites mauritianum*. Other includes *C. articulatus*, *C. dives*, *Echinochloa pyramidalis*, *Leersia hexandra*, *Mimosa pigra*, *Persicaria decipiens*, *P. setosula*, and *Typha domingensis*. Most of the species (72.1%) are herbaceous while shrubs and trees or woody climbers are few. The invasive *Mimosa pigra* and *Lantana camara* are common at the edges of the wetlands and have been identified as the most challenging ecological problems of recent years (Sharma *et al.* 2005). Cultivation in the wetland has also introduced a number of weed species, such as *Ageratum conyzoides*, *Digitaria ciliaris* and *Tagetes minuta*, into the wetland.

Busia County has a natural forest covering the hills of Samia and Budalang'i while other parts of the county have on-farm woodlots that have been integrated with agricultural farming. The County has two gazetted replanted forests mainly located in Budalang'i sub-county totaling to only 528.8 Ha. The un-gazetted forest is not mapped since it grows on individual holdings. The main forest products from the two types of forests include firewood and charcoal as fuel, medicinal plants, honey for commercial and domestic consumption, and timber for construction of houses. The commercial forests produce poles for sale to power companies among others.

Initiatives towards enhancing capacity of communities to conserve and provide alternative livelihood strategies so as to lessen dependence on the forest have been

undertaken by various stakeholders. The stakeholders include: national and international organizations including various non-governmental organizations (NGOs). Communities neighbouring forests are encouraged to sustainably use the forest and ensure that the natural habitat are protected. Enforcement and implementation of the national policy on 10 per cent forest has enhanced the County's forest conservation efforts.

The major plant agro-biodiversity in Busia are cereals, (maize, sorghum, finger millet) legumes (cowpeas, green grams, beans, Bambara nut (indigenous and local), Oil crops (sesame –*simsim*-, oil palm); tubers (cassava, sweet potato, taro); fruits (jackfruit, pineapple, pawpaw, mango, guava, passion fruit, gooseberries, bananas, sambarao); nuts (ground nuts); vegetables (indigenous vegetables, kale, tomato, cabbage, pepper). The total acreage under food crop cultivation is 145,412.5 acres, while 33,652.5 acres are under cash crop cultivation. The predominant cereal crop grown in Busia is maize (78%). A majority of households also grow sorghum and finger millet, both traditional cereal crops. Many households grow traditional vegetables, with the most popular being cowpeas, *Crotalaria brevidens*, *Crotalaria ochroleuca*, pumpkin leaves and African nightshade.

Table 2.1: Altitude, location and crops cultivated by farmers

Lower Mid Altitude I	Teso North and South	Bamboo and jackfruit, finger millet, local vegetables. <i>Solanum nigrum</i> (Sugha), <i>Cleome gynandra</i> (saga), <i>Corchorus olitorius</i> (Murere), <i>Crotalaria</i> sp (Mitoo) <i>Amaranthus</i> sp (Lipuoka)
Lower Mid Altitude II;	Matayos, Nambale & Butula	Sweet potatoes, sesame and ground nuts, jackfruit, black plum (Sambarao), finger millet, local vegetables
Lower-Mid Altitude III	Samia and part of Bunyala	Mangoes, reeds, finger millet, traditional local variety of cassava such as Matuja and Magana
Lower - Mid Altitude IV		Local vegetables

2.2 Animal Genetic Resources

Busia ecosystems used to be inhabited by 20 mammalian species about 30 years ago. However hunting of animals and birds coupled with recent landscape changes due to climate change and expansion of human settlement occasioned by increasing population, has led to some species of animal and birds disappearing or reducing in number and

distribution. Antelopes, gazelles, zebras are some of the animals that have completely disappeared from the Busia ecosystem.

Animal resources in Busia County are broadly classified as either domestic or wild. The major categories of domestic animals are:

- i) Cattle- zebus, crosses and pure exotic breeds
- ii) Poultry - chicken (local, crosses and hybrids), turkeys, quails, and guinea fowls, doves, geese and ducks,
- iii) Pigs (local breeds and exotic types)
- iv) Sheep - mainly local breeds with no exotic types due to limited economic importance attached to sheep
- v) Goats – local breeds mainly the small east African breed and exotic dairy goats (German alpins and Togenbergs) and cross breeds
- vi) Rabbits and guinea pigs– mainly cross breeds usually kept by youths as pets and sources of food and income
- vii) Donkeys - very few due to limited cultural acceptance despite significant economic potential in the area
- viii) Dogs- a wide range of local breeds with a few exotic types
- ix) Cats – usually kept as pets or rodent exterminators

Main types of wildlife found in the County include:

- i) Terrestrial: hippopotamus, antelopes (endangered), squirrels, porcupines, honey badger, wild pigs, crocodiles, monkeys, leopards (endangered), zebra (extinct), hyena, snakes, tortoises, turtle, newts, chameleon, mongoose, fox and a wide variety of birds
- ii) Aquatic: crocodile, catfish, varieties of fish (introduced and indigenous), frogs and toads

The hippopotamus, wild pigs and velvet monkeys are found in pockets of the County, mainly around the lake shores. These are among the endangered animal species and therefore require protection.

Birds

Busia has an important bird and biodiversity area. This area comprises a chain of small grassland patches (some seasonally flooded), including Mungatsi (36 ha, 0°27'67"N 34°19'69"E), Matayos (210 ha, 0°23'01"N 34°08'73"E), Sikoma (1 ha, 0°24'03"N 34°11'03"E), and Malanga (3 ha, 0°25'96"N 34°18'44"E). All the patches are surrounded by intensive agriculture, mainly maize and sugarcane, and are grazed by livestock. The most important of them is Mungatsi, located 2km from Mungatsi market along the

Mungatsi–Munami road. This privately-owned site lies on either side of a small stream (a tributary of River Sio), which is fringed by riverine forest and scrub.

Although birds can live in a variety of habitats, some species are habitat specific and thus vulnerable to habitat degradation and alteration. The wider Sio-Malaba-Malakisi catchment area represents an Important Bird Area (IBA) with over 300 bird species including the Papyrus Yellow Warbler (*Chrolopetta gracillostris*) and the Papyrus Gonolek (*Laniarius mufumbiri*). Of these birds, 18 are water specialists while 17 species are non-specialists. The Red-chested Sunbird and Blue-headed Coucal are the common specialist species. The Papyrus Canary, Carruthers's Cisticola, Papyrus Gonolek and Red-Chested Sunbird, are species restricted to Lake Victoria. Two species, the Papyrus gonolek (VU) and the Pallid Harrier (NT) are globally threatened (Bird Life International, 2008), while four other species (Hartlaub's Marsh Widowbird (VU), Grey Crowned Crane (NT), Grey Heron (NT) and African Marsh Harrier (NT) are threatened or near-threatened with extinction within the East African region, and are therefore species of regional concern.

Amphibians

Amphibians mostly comprise terrestrial or aquatic species, with only one arboreal species *Hyperolius kivuensis*. About 28 species of amphibians are suspected to occur and are predominantly found in the papyrus and grass swamps and also in rice fields. A number of reptiles exist in the county. Only eight (8) reptile species have been recorded in the wetland and riverine ecosystems. Python, crocodile (along Sio River) and monitor lizards have been recorded from actual presence.

Invertebrate communities

Invertebrates are important mediators in ecosystems at both macro and micro-levels in the aquatic, terrestrial, arboreal and subterranean settings. In these habitats they constitute part of the food chain and litter transformation as well as ecosystem engineering (Toyota et al., 2006). While some enhance life processes, others provide checks and balances to ensure optimal ecosystem performance. In the aquatic environment, invertebrates (for example copepods) are considered to be the main trophic link between primary producers and fish (Finlay and Roff, 2007).

Insects are a significant ecosystem component in Busia County based on the ecosystem services they provide. Available data indicate that the riverine and its associated wetlands are rich in micro- and macro- invertebrate fauna in the aquatic, terrestrial, subterranean and on-the-ground habitats. The diversity, distribution and abundance of invertebrates are dominated by Mollusca followed by Crustacea. In the terrestrial, subterranean and on-the-ground habitats the most abundant are Hemiptera (Insecta), Hymenoptera (Insecta) and Acarina (mites), respectively.

2.3 Aquatic Genetic Resources

Sources of fish include Lake Victoria rivers and their associated wetlands. A total number of 11 families and 29 species have been documented. Commercially valuable fish species include *Oreochromis niloticus*, *Lates niloticus*, *Labeo victorianus* and *Rastrineobola*

argentea. The major species upstream include *Synodontis* spp. and *Barbus* spp. In addition *Protopterus aethiopicus*, *Clarias gariepinus*, *Synodontis afrofisheri* and *S. victoriae* are very common. Cichlid species are restricted to the lower reaches while most barbs occur upstream. Some threatened species recorded, include *Momyrus* spp, *Gnathonemus longibarbis*, *Schilbe mystus* and *Bagrus docmac* (Ojuok, 2005). Their occurrence in River Sio is a major indicator of the important role played by rivers and their associated wetlands towards the protection of endangered fish species. Introduced species in wetlands and rivers include *Lates niloticus*, *Rastreonobola argentea* (a lacustrine species), *O. niloticus*, *O. lecostictus* and *Tilapia zillii*. The fishes need to be protected because of their important role in the food chain and as a possible bio-monitoring tool of environmental quality. There is a decline in fishery as a result of overfishing, ecosystem degradation, use of illegal gears, and capture of juvenile fish for bait fishery.

2.4 Microbial Genetic Resources

The diverse ecosystems in Busia are rich of microbes and microbial biodiversity resources. Several zooplankton and phytoplankton communities exist. Copepods, cladocerans and rotifers dominate the zooplankton community while in the phytoplankton community Cyanophyta, Chlorophyta and Bacillariophyta (Diatoms) are dominant. In addition several species of fungi and edible mushrooms (“limera” traditional yeast) and bacteria exist, and have extensively been used in fermenting and brewing liquor among the communities in Busia.

2.4 Indigenous Knowledge and Practices

The local communities own indigenous traditional knowledge on biological materials existing in the ecosystem in Busia County. This knowledge has been created and sustained by local communities as a means to meet their needs for food, shelter, health, spirituality, and savings. The biodiversity resources, together with the associated traditional knowledge, have not been collected, screened, isolated, documented and protected. This not only predisposes local communities to exploitation, but also exposes the County’s heritage in terms of natural resources and indigenous knowledge to bio-piracy and misappropriation.

2.5 Socio-Economic Importance of Biodiversity

Biodiversity underpins the majority of the rural livelihoods in Busia County. It benefits humanity through the provision of food, medicinal resources, wood products, ornamental plants, sources of breeding stocks/population reservoirs and future resources. The biodiversity resources are varied and range from termites to leafy vegetables, as well as fruits such as “Zambarao” and jackfruit to the nutritious wild mushrooms and indigenous poultry. The resources are found in different ecosystems of the County, often consumed during religious and cultural festivals. Little is known of their nutritional properties, while the associated indigenous knowledge with regard to collection and preparation of these foods is rapidly eroding. Other social benefits include research, education, recreation, tourism and cultural values.

Of the plant resources, indigenous species offer sustainability in terms of resilience and survival of communities. These species can withstand harsh climatic conditions and biotic and abiotic stresses, owing to their ease of uptake and restoration. Many communities continue to rely on indigenous species that are adapted to various agro-ecological conditions, and grow these crops often with low-input rain fed agricultural systems. The diversity within the species enables them to adapt to different soils, marginal, arid and mountain environments where improved varieties have failed to perform well. Of importance are the leguminous plant species that offer ecosystem services such as enhancing soil fertility.

Animal resources on the other hand are major sources of food (animal protein), tourism, ecosystem stability (pest control agents), pollinators, eco-tourism, and manure that is essential in enhancing soil fertility replenishment. The resources are also an important heritage and for recreation. Wild animals have been used as totems, cultural symbolism, traditional regalia, dowry payments and cultural appeasement of spirits. In terms of environment management, aquatic invertebrates are important bio-indicators of environmental quality because of their variant specificity to ecosystem preference and intolerance to habitat degradation.

Insects constitute a significant ecosystem component in Busia County with regard to the services they provide. Honey is one of the most economically valuable product from insect bees. Apiculture is a commercial enterprise in most parts of Busia and many families depend on honey as a major source of nutrition and income. Honeybees (stinging and stingless) also act as pollinators of crop species. Silk is extracted from cocoons of both reared caterpillars as well as from the wild, producing silk material that is highly valued in the domestic and international markets. Hundreds of butterfly species exist in the wild. Their economic value in tourism has made butterfly farming a popular business venture.

Insects also predate on harmful organisms thereby helping solve some problems faced by humans. Ladybugs consume aphids, mites and small caterpillars which destroy field crops. Dragonflies are important predators of mosquitoes both in water as larvae and adult mosquitoes in the air. The most important insect parasitoids in Busia include Braconid wasps that attack caterpillars and a wide range of other insects including greenfly. Chalcid wasps attack greenfly, whitefly, cabbage caterpillars and scale insects. Understanding and harnessing parasitoids offers the opportunity to develop biological control options for pests.

The idea of insects as human food (entomophagy) is well developed in Busia County. Termites, white ants, grasshoppers and army worms are consumed to meet the growing demand for food. This insectivorous practice among the Busia people is a unique cultural practice that has not developed in other parts of the country.

2.6 Institutions Engaged In Biodiversity Conservation

There are various initiatives on biodiversity conservation in Busia County. Institutions that have contributed to efforts in biodiversity conservation include Government Ministries and agencies such as the Kenya Wildlife Service (KWS), Kenya Forestry Research Institute (KEFRI), National Environment Management Authority (NEMA) and National Museums of Kenya (NMK), Kenya Marine and Fisheries Research Institution (KEMFRI), Kenya Agricultural and Livestock Research Organization (KALRO); and international organizations such as the International Livestock Research Institute (ILRI), Birdlife International, Central Artificial Insemination Service (CAIS), Nature Kenya, World Wildlife Fund (WWF), African Wildlife Foundation (AWF), International Union for the Conservation of Nature (IUCN), and the East African Wildlife Foundation (EAWF). These initiatives have made attempts to respond to the fact that Busia has a unique landscape with varied ecosystems, rich in both fauna and flora. The marine and terrestrial ecosystems are rich in biodiversity and have attracted researchers, scientists, curators and other professions for the purpose of bio prospecting.

CHAPTER THREE: POLICY ISSUES, CHALLENGES AND INTERVENTIONS ON BIODIVERSITY MANAGEMENT

3.1 Challenges in the Management of Biodiversity

The conservation, access and utilization of biodiversity in Busia County continues to be faced with several challenges. Most importantly, the economic, food security, cultural, recreational, scientific, educational, and environmental benefits derived from biodiversity and ecosystem services are perceived as low and largely unappreciated. Consequently, there have been no deliberate efforts to conserve this rich heritage that is of otherwise immense economic value. Even the few ad hoc conservation initiatives are normally regarded as an unnecessary burden on society with no tangible assured benefits. Communities have continued to unsustainably exploit the available resources without replenishment considerations. As a result unprecedented erosion of the rich biodiversity and habitat degradation has continued unabated since the past few decades. Left unchecked, this scenario is bound to wipe out the valuable biodiversity with disastrous effects on both the environment and community livelihoods. The following are some of the consequences occasioned by inadequate management of biodiversity:

- 1) Declining genetic variability and ecosystem stability;
- 2) Limited Access to and Inequitable Sharing of Benefits Accrued from Utilization of Biodiversity in Busia County
- 3) Limited use of local biodiversity occasioning rising cases of malnutrition and nutrient deficiency related ailments
- 4) Inadequate attention to research and development on local biodiversity

3.1.1 Declining genetic variability and ecosystem stability

Declining genetic variability, i.e. the declining diversity of plant species/varieties and animal species/breeds in Busia County is of great concern. Biological resources such as mud fish, indigenous trees and crops that were originally in abundance are now threatened by extinction due to lack/limited efforts towards conservation. Scramble for the remaining resources can only worsen genetic erosion, habitat degradation and ecosystem stability. This has the potential of denying resident communities not only the much desired ecological services but also the recreational, nutritional and health benefits derived from biodiversity.

The causes of declining genetic variability and ecosystem stability include:

1. Inadequate mainstreaming of biodiversity conservation and use in the County development plans and programmes
2. Increased demand for biodiversity resources due to increased population leading to over-exploitation of biodiversity

3. Land degradation due to human activities and inadequate soil conservation mitigation measures
4. Environmental pollution from agricultural inputs and household waste
5. Inadequate capacity to undertake/implement biodiversity conservation due to limited knowledge and skills.
6. Cultural beliefs/practices that lead to land fragmentation for settlement
7. Poor coordination amongst partners in the management of biodiversity and lack of legal and administrative frameworks for structured access of trans-boundary biodiversity
8. Inadequate involvement of women, youth and other vulnerable groups on matters of biodiversity conservation
9. Effects of Climate Change on continued *in situ* survival of biodiversity

3.1.2 Limited access to and inequitable sharing of benefits accrued from the utilization of biodiversity in Busia County

Though Busia County is rich in biodiversity, residents only derive limited benefits from the same. Where benefits exist, they are inequitably shared among actors along the biodiversity value chains. For instance, fish from Busia County is marketed raw and processed elsewhere for value addition. This tend to minimize potential benefits due to dismal prices fetched from the sold raw fish. Similarly, traditional knowledge holders are reluctant to disclose the same for commercial utility due to fear of bio-piracy. Mechanisms for documenting and protecting the knowledge to ensure that holders participate in benefit sharing are still lacking.

The following are reasons for the limited access to and inequitable sharing of benefits accruing from biodiversity:

1. Inherent fear for loss of knowledge ownership, particularly on traditional knowledge associated with medicinal plants and traditional foods.
2. Absence of institutional and regulatory framework governing access to biodiversity and associated knowledge, and mechanisms for sharing of benefits accrued from the utilization of transboundary and upstream/downstream resources
3. Limited knowledge and recognition of benefits of biodiversity among other traditional practices and innovations exacerbated by preferences for modern practices and approaches.

3.1.3 Limited use of local biodiversity occasioning rising cases of malnutrition and nutrient deficiency related ailments

While Busia County is biodiversity endowed, traditional food sources have over time lost popularity resulting in malnutrition and poor health among residents. For instance, animal and plant species such as mud fish and other unique fish species from Lake

Victoria and surrounding wetlands, white-ants, several traditional vegetables and mushrooms no longer form part of an everyday menu in most households.

The following are some of the reasons for the declining use of local biodiversity and rising cases of malnutrition and nutrient deficiency related ailments in Busia County:

1. Declining appreciation and recognition of medicinal and nutritional benefits derived from traditional foods and thus the changing eating preferences
2. Negative perception of local biodiversity/traditional foods as a poor man's diet.
3. Limited value addition and undeveloped marketing structures of products from indigenous biodiversity sources.
4. Relegating certain species (e.g. "omena" and giant rat) as inferior sources of food occasioning overreliance on a few others.
5. Inadequate integration of biodiversity conservation and use in education curricula at all levels

3.1.4 Inadequate attention to research and development on local biodiversity

The dismal appreciation of the role of local biodiversity in health, nutrition and environmental quality is attributable to limited attention to research. Even in cases where research has been undertaken, findings are hardly communicated to local communities in a manner that will enhance their appreciation of local biodiversity. The following are some of the reasons for the inadequate attention that is accorded to research and development and hence the low appreciation of the role of biodiversity:

1. Low priority rating of research for development
2. Poor linkages and collaboration between researchers, traditional practitioners and users of biodiversity resources/products
3. Limited Research and Development in regard to nutritional, health, and processing/packaging for value addition has been undertaken on traditional foods and medicinal plants
4. Available scientific evidence on the nutrition and health value of local biodiversity has not been packaged and disseminated in form easily consumable by communities

3.2 Policy Interventions

In order to address constraints impeding effective management of biodiversity so as to enhance its conservation, access to genetic resources and equitable sharing of benefits arising from their utilization, this County Policy will focus on the following interventions:

3.2.1 Enhancing County Biodiversity Conservation

Policy Objective: Enhanced conservation of biodiversity and associated ecosystems in Busia County.

Policy Interventions and Strategies

1. Mainstream and promote conservation of biodiversity resources and associated ecosystems within Busia County

- i) Factor biodiversity management in the County Integrated Development Plan (CIDP) and budgetary processes
- ii) Delineate and ring-fence biodiversity hotspots in Busia County and formulate their conservation development plan
- iii) Conserve and protect biodiversity hotspots in Busia County
- iv) Establish county and sub-county biodiversity centres
- v) Promote County Government/Private sector partnerships in conservation
- vi) Strengthen coordination of institutions and actors involved in biodiversity

2. Diversify livelihood sources and enhance value from biodiversity services to reduce pressure on biodiversity

- i) Improve attitudes and perceptions on conservation benefits from the currently neglected indigenous biodiversity products and by-products
- ii) Promote domestication and intensify production of indigenous and emerging biodiversity species to ease pressure on natural habitats
- iii) Promote processing of sourced biodiversity components to enhance value addition and commercialization of biodiversity products and services

3. Promote conservation of agro-landscapes and fragile ecosystems

- i) Develop and implement a County multi-sectoral land use master plan
- ii) Promote integrated land use and soil management initiatives

4. Reduce point and non-point environmental pollution

- i) Regulate the discharge of waste into natural, terrestrial and aquatic plant and animal habitats by industrial, domestic, municipal and agricultural activities
- ii) Enforce legislation on environment pollution

5. Develop capacity to undertake/implement biodiversity conservation and utilization

- i) Enhance conservation and utilization knowledge and skills through training of the county biodiversity conservation personnel and communities

- ii) Build the capacity of county government departments and other stakeholders to regulate and promote sustainable management of biodiversity
- iii) Build partnerships with external actors and promote exchange programmes to enhance biodiversity knowledge and skills of county personnel and communities.
- iv) Enhance capacity of the county for enterprise development and commercialization of biodiversity resources.

6. Mainstream gender (women, men, youth and other vulnerable groups) on matters of biodiversity conservation and use

- i) Integrate and promote gender in the conservation, commercialization and sharing of benefits arising out of biodiversity utilization
- ii) Institute innovative mechanisms for enhancing participation of school children, youth and other vulnerable groups in management of biodiversity

7. Reduce effects of Climate Change on *in situ* survival of biodiversity

- i) Mainstream biodiversity conservation and use into climate change adaptation/mitigation planning.
- ii) Promote use of biodiversity in climate change adaptation/mitigation programmes and initiatives.
- iii) Build ecosystem resilience to limit impacts on biodiversity.

3.2.2 Improving access to and ensuring equitable sharing of benefits accrued from utilization of biodiversity in Busia County

Policy Objectives: Accessible and equitable sharing of benefits accrued from utilization of biodiversity in Busia County.

Policy Interventions and Strategies

1. Sensitize individuals and communities on proprietary rights of biodiversity and associated traditional knowledge

- (i) Create awareness on the existing legal and administrative framework and other instruments on proprietary rights that govern access and benefits sharing
- (ii) Build capacity of regulatory institutions and communities to undertake IPR enforcement
- (iii) Take stock and document potential IPR, practices values and benefits of biodiversity and associated knowledge on existing county biodiversity

2. Develop administrative frameworks for structured ABS for trans-boundary and upstream/downstream resources

- (i) Customize the administrative framework on ABS for intra-county, inter-county and trans-boundary biodiversity resources and associated knowledge
- (ii) Negotiate mutual beneficial agreements with neighbouring counties.

3.2.3 Promoting Biodiversity utilization to enhance nutrition and management of health-related ailments

Policy Objective: Enhancing nutrition security and wellbeing of communities in Busia County.

Policy Interventions and Strategies

1. Influence change in cultural beliefs/practices that inhibit utilization of beneficial biodiversity

- (i) Promote practices and cultural beliefs that enhance use and conservation of local biodiversity
- (ii) Package and disseminate scientific evidence on nutritional and health values of biodiversity
- (iii) Integrate nutrition education that supports dietary and health choices in learning institutions (schools and tertiary) health services and community biodiversity management programmes
- (iv) Build partnerships to promote the use of biodiversity for enhanced nutrition and food security

3.2.4 Promoting Biodiversity Research and Development

Policy Objective: Enhancing the utilization of local biodiversity to stimulate county socio-economic development

Policy Interventions and Strategies

1. Research planning and agenda setting to prioritize and undertake biodiversity research

- (i) Establish working partnerships and collaboration with County-based and other Research institutions to identify and prioritize research needs.
- (ii) Mobilize resources to support research
- (iii) Disseminate and commercialize developed technology/protocols, information and management practices

CHAPTER FOUR: POLICIES, STRATEGIES AND PLANS OF ACTIONS

This policy will focus on four principal areas for addressing the proper management and utilization of County biodiversity namely; enhancing biodiversity conservation; improving access to and ensuring equitable sharing of benefits accrued from access and utilization of county biodiversity; promoting biodiversity utilization; and promoting biodiversity research and development. Policy objectives will be realized through the implementation of strategies and actions under each of the four policy focus areas.

4.1 Enhancing County Biodiversity Conservation

In order to promote and institute conservation mechanisms that will enhance biodiversity management in Busia County, the following strategies and actions are considered critical:

4.1.1 Mainstream and promote conservation of biodiversity resources and associated ecosystems within Busia County

Strategy 4.1.1.1 Factor biodiversity management in county planning – the County Integrated Development Plan (CIDP) - and budgetary processes

Activities

- Sensitize policymakers and County government on the value of biodiversity.
- Lobby for inclusion of biodiversity management in development plans
- Develop a biodiversity management plan and incorporate in the integrated county development plan

Strategy 4.1.1.2 Delineate and ring-fence biodiversity hotspots in Busia County and formulate their conservation development plan

Activities

- Identify expertise and institute biodiversity hotspot survey team.
- Undertake mapping/profiling to identify biodiversity hotspots.
- Formulate management plans for the identified biodiversity hot spots.

Strategy 4.1.1.3 Conserve and protect biodiversity hotspots in Busia County.

Activities

- Identify actors/partners and assign responsibilities
- Mobilize resources to implement management plans
- Monitor progress of implementation

Strategy 4.1.1.4 Establish county and sub-county biodiversity centres

Activities

- Identify land and establish county *in-situ* sites and *ex-situ* conservation station/centres.

- Mobilize communities undertake *in situ* and *ex situ* conservation of selected species.
- Capacity build communities to manage county *in-situ* sites and ex-situ conservation station/centres

Strategy 4.1.1.5 Promote County Government/Private sector partnerships in conservation

Activities

- Map private sector interests to identify potential partners
- Identify incentives for private sector engagement.
- Develop partnerships engagement instruments for biodiversity management.

Strategy 4.1.1.6 Strengthen coordination of institutions and actors involved in biodiversity

Activities

- Stakeholder mapping to identify roles, responsibilities and on-going initiatives.
- Establish a stakeholder platform and institute governance structures and coordination mechanisms.

4.1.2 Diversify livelihood sources and enhance value from biodiversity services to reduce pressure on biodiversity

Strategy 4.1.2.1 Improve attitudes and perception on conservation benefits from the currently neglected indigenous biodiversity products and by-products

Activities

- Prepare awareness raising campaign materials.
- Conduct awareness raising campaigns

Strategy 4.1.2.2 Promote domestication and intensify production of indigenous and emerging biodiversity species to ease pressure on natural habitats

Activities

- Identify domestication priority species
- Develop production and sustainable harvesting protocols
- Capacity build communities on production, GAPs and sustainable harvesting
- Upscale and out-scale production

Strategy 4.1.2.3 Promote processing of sourced biodiversity components to enhance value addition and commercialization of biodiversity products and services.

Activities

- Identify and establish potential cottage industries.
- Capacity build communities in processing and value addition.

- Establish partnership with private sector to evolve the cottage industries.

4.13 Promote conservation of agro-landscapes and fragile ecosystems

Strategy 4.1.3.1 Develop and implement a county multi-sectoral land use master plan

Activities

- Sensitize planners on the need for conservation of biodiversity.
- Undertake survey to identify degraded and fragile ecosystems.
- Provide input that feeds into the development of County land use master plans including the protection of degraded and fragile ecosystems.

Strategy 4.1.3.1 Promote integrated land use and soil management initiatives

Activities

- Develop guidelines on land use and integrated soil management (ISM) practices.
- Capacity build communities on land use and integrated soil management
- Undertake soil fertility management and conservation interventions.
- Raise awareness and promote cultural beliefs/practices that reduce land fragmentation

4.1.4 Reduce point and none-point environmental pollution

Strategy 4.1.4.1 Regulate the discharge of waste into natural, terrestrial and aquatic plant and animal habitats by industrial, domestic, municipal and agricultural activities.

Activities

- Raise awareness on the impacts of pollution on environmental health and promote community policing.
- Strengthen county legal frameworks governing discharge of waste into natural terrestrial and aquatic plant and animal habitats by industrial, domestic, municipal and agricultural activities.

Strategy 4.1.4.1 Enforce legislation on environment pollution.

Activities

- Enhance the capacity of regulatory agencies to enforce compliance on biodiversity conservation
- Recruit additional personnel for inspection and enforcement
- Coordinate the enforcement of laws and regulations on discharge of industrial effluent, solid and other liquid wastes.

4.1.5 Develop capacity to undertake/implement biodiversity conservation and utilization.

Strategy 4.1.5.1 Enhance conservation and utilization knowledge and skills through training of the county biodiversity conservation personnel and communities.

Activities

- Undertake training needs assessment.
- Develop training tools and execute the training.
- Assess impacts of training activities.

Strategy 4.1.5.1 Build the capacity of county government departments and other stakeholders to regulate and promote sustainable management of biodiversity

Activities

- Undertake training needs assessment.
- Develop training tools and execute the training
- Assess impacts of training activities.

Strategy 4.1.5.1 Build partnerships with external actors and promote exchange programmes to enhance biodiversity knowledge and skills of county personnel and communities.

Activities

- Benchmarking tours and visits on biodiversity management.
- Establish collaborative initiatives on biodiversity management.

Strategy 4.1.5.1 Enhance capacity of the county for enterprise development and commercialization of biodiversity resources.

Activities

- Identify and select priority potential value chains for enterprise development and commercialization.
- Identify and engage value chain enterprise developers
- Capacity build communities on enterprise development and commercialization.

4.1.6 Mainstream gender (women, men, youth and other vulnerable groups) on matters of biodiversity conservation and use

Strategy 4.1.6.1 Integrate and promote gender in the conservation, commercialization and sharing of benefits arising out of biodiversity utilization

Activities

- Address socio-cultural and economic constraints limiting MWY&VG, participation in biodiversity utilization
- Involve men, women, youth and other vulnerable groups (MWY&VG) in planning and implementation of biodiversity conservation, commercialization and sharing of benefits.

Strategy 4.1.6.1 Institute innovative mechanisms for enhancing participation of school children, youth and other vulnerable groups in management of biodiversity.

Activities

- Identify and select best practices to engage school children, youth and other vulnerable groups in biodiversity management.
- Identify and use innovative approaches for engaging youth and other vulnerable groups in biodiversity management (e.g. creative arts, drama, etc.).

4.1.7 Reduce effects of Climate Change on *in situ* survival of biodiversity

Strategy 4.1.7.1 Mainstream biodiversity conservation and use into climate change adaptation/mitigation planning.

Activities

- Engage partnerships with actors engaged in climate change adaptation/mitigation initiatives.
- Initiate and execute joint programmes and projects addressing climate change and biodiversity management.

Strategy 4.1.7.1 Promote use of biodiversity in climate change adaptation/mitigation programmes and initiatives.

Activities

- Identify and promote use of appropriate climate change resilient biodiversity in adaptation/mitigation programmes.
- Capacity build communities in use of resilient biodiversity to adapt/mitigate against climate change.

Strategy 4.1.7.1 Build ecosystem resilience to limit impacts on biodiversity

Activities

- Promote eco-friendly measures such as conservation tillage/conservation agriculture; agro-forestry; integrated soil fertility management; rotational, cropping and enterprise mix; and preventing erosion.
- Develop and encourage large, area-based landscape scale programmes and projects to restore, rehabilitate or conserve agro-ecosystems.

4.2 Improving access to and ensuring equitable sharing of benefits accrued from utilization of biodiversity in Busia County.

4.2.1 Sensitize individuals and communities on proprietary rights of biodiversity and associated traditional knowledge.

Strategy 4.2.1.1 Create awareness on the existing legal and administrative framework and other instruments on proprietary rights that govern access and benefits sharing.

Activities

- Identify appropriate communication channels
- Develop awareness raising materials
- Educate communities on benefits of IPR including the value of local indigenous foods, medicine, and other practices and innovations

Strategy 4.2.1.2 Build capacity of regulatory institutions and communities to undertake IPR enforcement.

Activities

- Identify existing governing structures among the communities
- Institute governing structures where they do not exist.
- Capacity build institutions and communities on IPR protection.

Strategy 4.2.1.3 Take stock and document potential IPR, practices values and benefits of biodiversity and associated knowledge on existing county biodiversity.

Activities

- Undertake participatory IPR inventory surveys
- Develop a data base for IPR for Busia
- Identify IP that qualify for ABS and develop access procedures.

4.2.2 Develop administrative frameworks for structured ABS for trans-boundary and upstream/downstream resources

Strategy 4.2.2.3 Customize the administrative framework on ABS for intra- county, inter-county and transboundary biodiversity resources and associated knowledge.

Activities

- Take stock of the transboundary resources
- Engage stakeholders in developing access and benefit sharing mechanisms.
- Establish access and benefits sharing administrative procedures.

Strategy 4.2.2.3 Negotiate mutual beneficial agreements with neighbouring counties.

Activities

- Constitute a county negotiating team
- Capacity build the team
- Conduct negotiations on need basis.

4.3 Promoting Biodiversity Utilization to enhance nutrition and management of health related ailments

4.3.1 Influence change in cultural beliefs/practices that inhibit utilization of beneficial biodiversity

Strategy 4.3.1.1 Promote practices and cultural beliefs that enhance use and conservation of local biodiversity

Activities

- Identify and take stock of practices and cultural beliefs that enhance use and conservation of biodiversity
- Disseminate information on practices and cultural beliefs that enhance use and conservation of local biodiversity.

Strategy 4.3.1.2 Package and disseminate scientific evidence on nutritional and health values of biodiversity.

Activities

- Collate existing and establish a database on scientific evidence.
- Disseminate information on nutritional and therapeutic value of local biodiversity

Strategy 4.3.1.3 Integrate nutrition education that support dietary and health choices in learning institutions (schools and tertiary) health services and community biodiversity management programmes

Activities

- Undertake food composition data on local biodiversity to inform nutrition education.
- Develop nutrition education material.
- Identify and package information to suit target audience.
- Lobby relevant authorities to incorporate nutrition education in their training tools.

Strategy 4.3.1.4 Build partnerships to promote use of biodiversity for enhanced nutrition and food security

Activities

- (i) Develop a coordination framework to synergize the roles and functions of institutions
- (ii) Develop a plan to monitor biodiversity utilization's contribution to food and nutrition security.

4.4 Promoting Biodiversity Research and Development

4.4.1 Research planning and agenda setting to prioritize biodiversity research

Strategy 4.4.1.1 Establish working partnerships and collaboration with county-based and other Research institutions to identify and prioritize research needs

Activities

- Identify relevant partners and collaborators and undertake joint research needs assessment.
- Prioritize research agenda for identified biodiversity issues.

Strategy 4.4.1.2 Mobilize resources to support research

Activities

- Develop collaborative projects addressing County priority research needs.
- Lobby county government and other development partners to support biodiversity research.
- Undertake relevant research to deliver technologies/protocols, information and management practices.

Strategy 4.4.1.3 Disseminate and commercialize developed technology/protocols, information and management practices

Activities

- Package and disseminate research findings on biodiversity conservation and use
- Establish public-private partnerships to commercialize research findings and products

CHAPTER FIVE: POLICY IMPLEMENTATION AND REVIEW

The effective implementation of this policy will require coordinated management of its implementation in order to achieve the outlined policy objectives. This will require the establishment of a coordinating institutional framework that brings on board various county subsectors involved in various aspects of biodiversity. In addition, a planning, implementation, monitoring and evaluation framework will be put in place and resources mobilized for programme implementation.

5.1 Institutional Framework for Policy Implementation

The institutional framework for policy implementation will be established by bringing on board existing key departments and institutions that will facilitate the active participation of the political leadership, technical departments, communities, civil society and the private sector. This framework will comprise the following key departments and institutions;

- i) The departments of environment, agriculture, livestock, forestry, health and education
- ii) Programmes and projects dealing with environment and natural resources conservation and utilization
- iii) Local communities representatives from all sub counties involved in natural resources conservation and utilization
- iv) Development partners supporting various programmes in the county research and academic institutions involved in biodiversity conservation and utilization or study
- v) Practitioners in ethno medicines (traditional healers) and ethno-veterinary opinion leaders and those with institutional memories on traditional knowledge.

The following institutional roles and structure is proposed for planning coordination and implementation of the biodiversity policy.

- i) **County Biodiversity Steering Committee** responsible for policy oversight and guiding overall implementation. Membership will include County Executive Committee Ministers (CECM) of Agriculture, Environment, Education and Health
- ii) **County Policy Implementation Committee** responsible coordination of technical implementation of policy interventions and strategies. Will comprise of County Directors of technical Departments and shall closely liaise with relevant national public agencies responsible for aspects of biodiversity management and regulation e.g. NEMA, KWS, NMK, and development partners
- iii) **Thematic/Technical Working Group (TWGs)**. Responsible for technical guidance and on various thematic areas that define the biodiversity policy thrust. Four TWG are proposed as follows:
 - (a) Promotion and development of measures for biodiversity conservation

- (b) Awareness creation and participation on sustainable use of biodiversity
- (c) Mainstreaming biodiversity agenda in County programme planning and implementation
- (d) Capacity building for biodiversity conservation, use, access and management of benefits
- (e) Measures for adaptation and mitigation on impact of biodiversity loss

(i) Sub-County Implementation Coordination Units

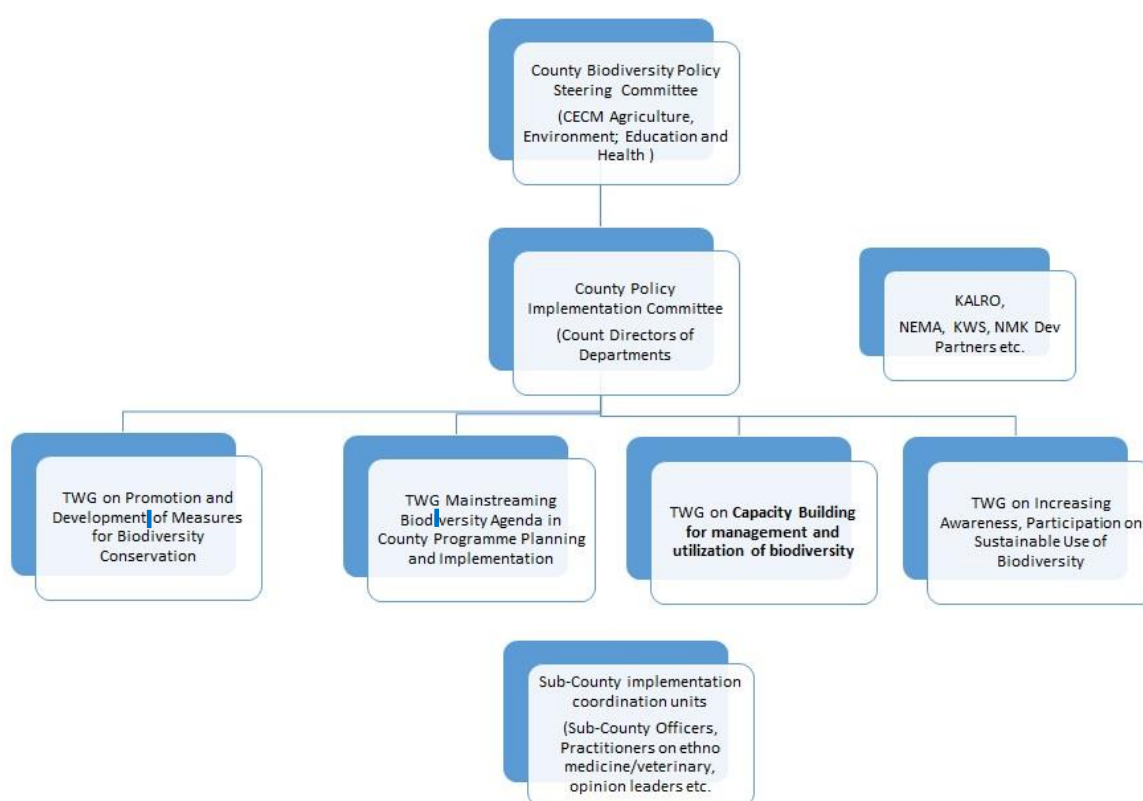


Fig.2: Organizational structure for Busia County Biodiversity Policy Implementation

5.2 Resource Mobilization

To ensure effective and quality monitoring and evaluation, it is critical to set aside adequate financial and human resources at the planning stage. The required financial and human resources for monitoring and evaluation should be considered within the overall costs of delivering the agreed results and not as additional costs.

5.3 Monitoring and Evaluation

Proper planning, monitoring and evaluation is essential for Effective implementation of policy interventions. It enables the assessment of whether implementation is progressing in the right direction, whether progress and desired results and impacts are being realized and how future efforts might be improved. Monitoring and evaluation is therefore useful in tracking past and on-going activities that is useful for implementation

fine-tuning, reorientation and future planning. Policy programmes with strong monitoring and evaluation components tend to stay on track. Additionally, problems are often detected earlier, which reduces the likelihood of having major cost overruns or time delays later.

The monitoring and evaluation framework for the Busia Biodiversity Conservation Policy will focus and be based on the following;

- i) Sound institutional planning and implementation framework for effective coordination of all dimensions of diversity that takes into account the inter-linkages and dependencies between planning, monitoring and evaluation
- ii) Proper planning and clear articulation of intended results in a results matrix agreed among the key stakeholders. The matrix shall outline the following
 - a. What is to be monitored and evaluated
 - b. The activities needed to monitor and evaluate
 - c. Who is responsible for monitoring and evaluation activities
 - d. When monitoring and evaluation activities are planned (timing)
 - e. How monitoring and evaluation will be carried out (methods)
 - f. What resources are required and where they will be committed
- iii) Proper tracking and reporting (data capture and documentation) of implementation progress analysis and review

This policy will be implemented over the next 5 to 8 years beginning January 2016 and will be reviewed based on the periodic review and evaluation of implementation and realization of the policy objectives.

Review will also consider emerging issues and the national and international level and constantly focus on Country priorities while considering the interconnected nature of biodiversity across Counties.

ANNEXES

Annex I: Policy Implementation Framework

4.1 Enhancing County Biodiversity Conservation

Policy Issue: Declining genetic variability and ecosystem stability							
Policy Objective: Enhanced conservation of biodiversity and associated ecosystems in Busia County							
Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/Other actors	Time frame (Cont. ¹ ; ST ² ; MT ³ ; LT ⁴)	Cost (Million KSh)
4.1.1 Mainstream and promote conservation of biodiversity resources and associated ecosystems within Busia County	4.1.1.1: Factor biodiversity management in county planning (CIDP) and budgetary processes	Sensitize policy makers and County government on the value of biodiversity	Policy makers, County assembly and CECs sensitized	No. of meetings and workshop/seminars	Dept. Agric. Education Dept. WENR Dept. of Health & sanitation Dept. of Environment , Culture & Social Services	ST	0.21
		Lobby for inclusion of biodiversity management in development plans	Biodiversity management incorporated in the CIDP	Elements of biodiversity management captured in the CIDP	Dept. Agric. Education Dept. WENR Dept. of Health & sanitation	ST	0.40

¹ Cont – Continuous;

² ST – Short Term (Up to 3 years)

³ MT- Medium Term (up to 5 years)

⁴ LT – Long Term (up to 7 Years)

		Develop a biodiversity management plan and incorporate in the integrated County development plan (CIDP)	Biodiversity management plan developed	First biodiversity management plan for Busia County developed	Dept. Agric. Education Dept. WENR Dept. of Health & Sanitation Dept. of Environment , Culture & Social Services	ST	0.21
	4.1.1.2 Delineate and ring-fence biodiversity hotspots in Busia County and formulate their conservation development plan	Identify expertise and institute biodiversity hotspot survey team	Expert team instituted	Appointment letters and minutes of team meetings Consultative workshop proceedings	CECs/CEOs of Agriculture, Livestock and Fisheries Culture & Social Services Education, Health DWENR, DRSRS, KALRO, NMK, KEMRI	ST	1.00
		Undertake mapping/profiling to identify biodiversity hotspots	Hotspots mapped and profiled	No. of hotspots mapped and profiled	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Health, DWENR, DRSRS, KALRO, KEMFRI, KEFRI, NMK, KFS, KEMRI	ST	100.00
		Formulate management plans for the identified biodiversity hot spots	Hotspots Management plans developed	No. of management plans	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Health DWENR, DRSRS, KALRO, NMK, KEMFRI, KEFRI, KFS	Cont.	5.00
	4.1.1.3 Conserve and protect biodiversity hotspots in Busia County	Identify actors/partners and assign responsibilities	Partners identified and responsibilities assigned	No. of MOUs No. of action plans	Dept. of Agriculture, Livestock and Fisheries, DWENR,	ST	1.00
		Mobilize resources to implement management plans	At least 3 biodiversity projects implemented	One (1) biodiversity project funded in the phase of implementation	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Health DWENR, DRSRS,	Cont.	5.00

					KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS		
		Monitor progress of implementation	Implementation of biodiversity management plans monitored biannually	No. of monitoring reports per year	CECs Chief Officers	Cont.	2.50
	4.1.1.4 Establish county and sub-county biodiversity centres	Identify land and establish county <i>in-situ</i> sites and <i>ex-situ</i> conservation centres	Sites for <i>in-situ</i> sites and <i>ex-situ</i> identified	No. of sites established	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, DRSRS, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	ST	50.00
		Mobilize communities and undertake <i>in situ</i> and <i>ex situ</i> conservation of selected species	Communities mobilized	No. of community groups conserving No. of in-situ and ex-situ sites No. of species conserved	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KFS, KEFRI, NMK, communities	LT	150.00
		Build the capacity of communities to manage county <i>in-situ</i> sites and <i>ex-situ</i> conservation centres	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Dept. of Agriculture, Livestock and Fisheries, Education, Lands, Health, Culture & Social Services DWENR, DRSRS, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	5.00
	4.1.1.5 Promote County Government/Private sector partnerships in conservation	Map private sector interests to identify potential partners	Potential partners identified and interests determined	No. of identified potential partners	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, DRSRS, KALRO, KEMFRI,	ST	0.50

					KEFRI, NMK, KEMRI, KFS, communities		
		Identify incentives for private sector engagement	Incentives identified Private sector participation enhanced	No. of private sector engagements in biodiversity conservation	CECs County Assembly, Private sector, communities	Cont.	10.00
		Develop partnership engagement instruments for biodiversity management	MOUs, Agreements signed with private sector	No. of partnership instruments signed	County Government, Private sector, communities	Cont.	5.00
	4.1.1.6 Strengthen coordination of institutions and actors involved in biodiversity	Stakeholder mapping to identify roles, responsibilities and on-going initiatives	Stakeholders mapped; responsibilities and on-going initiatives established	No. of stakeholder meetings No. of on-going initiatives documented	Dept. of Agriculture, Livestock and Fisheries, Education, Culture & Social Services, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	2.00
		Establish a stakeholder platform and institute governance structures and coordination mechanisms	Governance structures of stakeholder platform instituted	One functional stakeholder platform	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities, private sector	Cont.	10.00
	4.1.2: Diversify Livelihood Sources and Enhance Value from Biodiversity Services to	4.1.2.1 Improve attitudes and perception on conservation benefits from the currently neglected indigenous biodiversity products	Prepare awareness-raising campaign materials	Awareness-raising campaign materials developed	No. of awareness-raising products No. of communication channels identified	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI,	ST

Reduce Pressure on Biodiversity	and by-products from indigenous animal products and by-products				KEFRI, NMK, KEMRI, KFS, communities		
		Conduct awareness-raising campaigns	Awareness-raising campaigns organized	No. of targeted audiences No. of campaigns held	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	20.00
	4.1.2.2: Promote domestication and intensify production of indigenous and emerging biodiversity species to ease pressure on natural habitats	Identify domestication priority species	Priority species for domestication identified	No. of priority species	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	3.00
		Develop production and sustainable harvesting protocols	Protocols for production and sustainable harvesting developed	No. of protocols No. of printed copies	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities ADSP, KEBS	Cont.	10.00
		Build the capacity of communities on production, GAPs and sustainable harvesting	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR,	Cont.	10.00

					KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities		
		Upscale and out-scale production	Viable commercial enterprises established	No. of viable enterprises Acreage of domesticated species	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	10.00
	4.1.2.3: Promote the processing of sourced biodiversity components to enhance value addition and commercialization of biodiversity products and services	Identify and establish potential cottage industries	Potential cottage industries identified and established	No. of cottage industries established	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	LT	50.00
		Capacity build communities in processing and value addition	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	10.00
		Establish partnership with private sector to evolve the cottage industries	Private sector participation enhanced	No. of private sector engagements in cottage industries	Dept. of Agriculture, Livestock and Fisheries, Culture & Social Services Education, Lands, Health DWENR, KALRO, KEMFRI, KEFRI, NMK, KEMRI, KFS, communities	Cont.	5.00

4.1.3 Promote conservation of agro-landscapes and fragile ecosystems	4.1.3.1 Develop and implement a county multi-sectoral land use master plan	Sensitize planners on the need for conserving biodiversity	County planners sensitized on need for biodiversity conservation	No. of planners sensitized No. of workshops/meetings	Dept. Agric.; Education Dept. WENR; Dept. of Health & Sanitation; ADSP; Community, markets; opinion leaders	ST	2.00
		Undertake survey to identify degraded and fragile ecosystems	Degraded and fragile ecosystems identified	No. of ecosystems identified	Dept. Agric.; Education Dept. WENR; Dept. of Health & Sanitation; ADSP; Community, markets; opinion leaders	ST	3.00
		Provide input that feeds into the development of County land use master plans including the protection of degraded and fragile ecosystems	Elements on protection of fragile and degraded ecosystems incorporated in county land use master plan	The first county master plan containing elements on protection of fragile and degraded ecosystems developed	Dept. Agric.; Education Dept. WENR; Dept. of Health & Sanitation; ADSP; Community, markets; opinion leaders	ST	5.00
	4.1.3.2: Promote integrated land use and soil management initiatives	Develop guidelines on land use and integrated soil management (ISM) practices	Guidelines on land use and integrated soil management (ISM) practices developed	No. of guidelines No. of guidelines printed and distributed to communities	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO, KFS	Cont.	4.00
		Build capacity of communities on land use and integrated soil management	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO, KFS	Cont.	10.00
		Undertake soil fertility management and conservation interventions	Soil fertility management and conservation interventions implemented	No. of communities groups/individuals disaggregated by gender practicing the interventions	Communities Dept. Agric. Planning and Devolution; Dept. WENR; ADSP, KALRO, KFS	Cont.	5.00
		Raise awareness and promote cultural beliefs/practices that reduce land fragmentation	Communities and stakeholders aware of and avoid cultural beliefs/practices that	No. of targeted audiences	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP, KALRO, KFS	Cont.	20.00

			encourage land fragmentation	No. of campaigns held			
4.1.4: Reduce point and non-point environmental pollution	4.1.4.1: Regulate the discharge of waste into natural, terrestrial and aquatic plant and animal habitats by industrial, domestic, municipal and agricultural activities	Raise awareness on the impacts of pollution on environmental health and promote community policing	Communities and stakeholders aware of the impacts of pollution on environmental health	No. of targeted audiences No. of campaigns held	Agriculture; DWENR, Dept. of land; Dept. of culture; Dept. of Health; Communities	LT	10.00
		Strengthen County legal frameworks governing discharge of waste into natural terrestrial and aquatic plant and animal habitats by industrial, domestic, municipal and agricultural activities	Coordination framework for law enforcement agency established	Existence of a functional enforcement/coordinating framework	Agriculture; DWENR, Dept. of land; Dept. of culture; Dept. of Health	MT	20.00
	4.1.4.2 Enforce legislation on environment pollution	Enhance the capacity of regulatory agencies to enforce compliance on biodiversity conservation	Enforcement agencies trained and equipped	No. of trainings for enforcement agencies	Agriculture; DWENR, Dept. of Land; Dept. of Culture; Dept. of Health; Communities	LT	15.00
		Recruit additional personnel for inspection and enforcement	Additional personnel for inspection and enforcement recruited	No. of inspection personnel recruited	Agriculture; DWENR; Dept. of land; Dept. of Culture, Dept. of Health	Cont.	40.00
		Coordinate the enforcement of laws and regulations on discharge of industrial effluent, solid and other liquid wastes	Coordination framework for law enforcement agency established	Existence of a functional enforcement/coordinating framework	Agriculture; DWENR; Dept. of land; Dept. of Culture, Dept. of Health	MT	20.00
4.1.5 Develop capacity to undertake/implement biodiversity conservation and utilization	4.1.5.1 Enhance conservation and utilization knowledge and skills through training of the county biodiversity conservation	Undertake training needs assessment	Needs assessment established	No. of trainings needs assessed No. of community groups/individuals disaggregated by gender trained	Agriculture; DWENR; Dept. of land; Dept. of Culture, Dept. of Health	Cont.	15.00
		Develop training tools and deliver training	Tools for training developed	No. of training tools No of printed copies	Agriculture; DWENR; Dept. of land; Dept. of Culture, Dept. of Health	Cont.	10.00

	personnel and communities	Assess impacts of training activities	Guidelines on trainings developed	No. of guidelines No. of guidelines printed and distributed to communities No. of evaluations carried out	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO; and KFS	Cont.	4.00
	4.1.5.2 Build the capacity of county government departments and other stakeholders to regulate and promote sustainable management of biodiversity	Undertake training needs assessment	Needs assessment established	No. of trainings needs assessed No. of community groups/individuals disaggregated by gender trained	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO; and KFS	Cont.	15.00
		Develop training tools and deliver the training	Tools for training developed	No. of training tools No. of printed copies	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO; and KFS	Cont.	10.00
		Assess impacts of training activities	Guidelines on trainings developed	No. of guidelines No. of guidelines printed and distributed to communities No. of evaluations carried out	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO; and KFS	Cont.	4.00
	4.1.5.3 Build partnerships with external actors and promote exchange programmes to enhance biodiversity knowledge and skills of County personnel and communities	Benchmarking tours and visits on biodiversity management	Biodiversity opportunities established	No. of benchmarking tours and visits	Dept. Agric. Planning and Devolution; Dept. WENR; ADSP; Communities; KALRO; and KFS	Cont.	20.00
		Establish collaborative initiatives on biodiversity management	Collaborative initiatives established MOUs/Agreements signed with private sector	No. of collaborative initiatives established No. of partnership instruments signed	County Government; Private sector; Communities	Cont.	10.00

	4.1.5.4 Enhance capacity of the County for enterprise development and commercialization of biodiversity resources	Identify and select priority potential value chains for enterprise development and commercialization	Priority potential value chains for enterprise development identified	No. of priority potential value chains for enterprise developed	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands, Health; DWENR; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	10.00
		Identify and engage value chain enterprise developers	Value chain enterprise developers engaged	No. of value chain enterprise developers established	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands, Health; DWENR; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	LT	50.00
		Build capacity of communities on enterprise development and commercialization	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands, Health; DWENR; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	10.00
4.1.6 Mainstream gender (women, men, youth and other vulnerable groups) on matters of biodiversity conservation and use	4.1.6.1 Integrate and promote gender in the conservation, commercialization and sharing of benefits arising from biodiversity utilization	Address socio-cultural and economic constraints limiting WMY&VG, participation in biodiversity utilization	Socio-cultural and economic constraints limiting WMY&VG , participation addressed	No. of forums to address Socio-cultural and economic constraints No. of campaigns held	Dept. of Agriculture; DWENR; Dept. of Land, Dept. of Culture, Dept. of Health; Communities	LT	10.00
		Involve women, men, youth and other vulnerable groups (WMY&VG) in planning and implementation of biodiversity conservation,	Women, men, youth and other vulnerable groups (WMY&VG) involved in implementation	No. of women, men, youth and other vulnerable groups (WMY&VG) involved and disaggregated by gender in	Dept. of Agriculture; DWENR; Dept. of Land, Dept. of Culture, Dept. of Health; Communities	Cont.	10.00

		commercialization and sharing of benefits		biodiversity management			
	4.1.6.2 Institute innovative mechanisms for enhancing participation of school children, youth and other vulnerable groups in management of biodiversity	Identify and select best practices to engage school children, youth and other vulnerable groups in biodiversity management	Best practices to engage school children, youth and other vulnerable groups in biodiversity management established	No. of best practices adopted No. of best practices printed and distributed to communities No. of school children, youth and other vulnerable groups involved	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR, KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities	Cont.	4.00
		Identify and use innovative approaches for engaging youth and other vulnerable groups in biodiversity management (e.g. creative arts, drama, etc.)	Innovative approaches used to engage the youth	No. of innovative approaches adopted No. of innovative approaches printed and distributed to communities No. of school children, youth and other vulnerable groups involved	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR, KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities	Cont.	12.00
4.1.7. Reduce effects of Climate Change on <i>in situ</i> survival of biodiversity	4.1.7.1 Mainstream biodiversity conservation and use into climate change adaptation/mitigation planning	Engage in partnerships with actors engaged in climate change adaptation/mitigation initiatives	Potential partners identified and interests determined	No. of identified potential partners No. of engagements	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR, KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities	ST	0.50
		Initiate and execute joint programmes and projects addressing climate change and biodiversity management	Collaborative initiatives established MOUs/Agreements signed with private sector	No. of collaborative initiatives established No. of partnerships instruments signed	County Government; Private sector; Communities	Cont.	5.00

	4.1.7.2 Promote use of biodiversity in climate change adaptation/mitigation programmes and initiatives	Identify and promote use of appropriate climate change resilient biodiversity in adaptation/mitigation programmes	Appropriate climate change resilient biodiversity in adaptation/mitigation programmes identified and promoted	No. of appropriate climate change resilient biodiversity in adaptation/mitigation programmes	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR, KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities	Cont.	15.00
		Build the capacity of communities to use resilient biodiversity to adapt/mitigate against climate change	Communities trained and skills enhanced	No. of community groups/individuals disaggregated by gender trained	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR, KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities	Cont.	10.00
	4.1.7.3 Build ecosystem resilience to limit impacts on biodiversity	Promote eco-friendly measures such as conservation tillage/conservation agriculture; agroforestry; integrated soil fertility management; rotational, cropping and enterprise mix; and preventing erosion	Eco-friendly interventions implemented	No. of communities groups/individuals disaggregated by gender practicing the interventions	Communities; Dept. of Agriculture, Planning and Devolution; Dept. WENR; ADSP; KALRO and KFS	Cont.	20.00
		Develop and encourage large, area-based landscape scale programmes and projects to restore, rehabilitate or conserve agro-ecosystems	Sustainable large, area-based landscape scale programmes and projects established	No. of sustainable large, area-based landscape scale programmes and projects Acreage restored, rehabilitated or conserved agro-ecosystems	Communities; Dept. of Agriculture, Planning and Devolution; Dept. WENR; ADSP; KALRO and KFS	Cont.	50.00

4.2 Improving access to and ensuring equitable sharing of benefits accrued from utilization of biodiversity in Busia County

Policy Issue: Limited Access to and Inequitable Sharing of Benefits Accrued from Utilization of Biodiversity in Busia County

Policy Objective: Accessible and equitable sharing of benefits accrued from utilization of biodiversity in Busia County

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/Other actors	Time frame (Cont. ⁵ ; ST ⁶ ; MT ⁷ ; LT ⁸)	Cost (Millions KSh)
4.2.1 Sensitize individuals and communities on proprietary rights of biodiversity and associated traditional knowledge	4.2.1.1 Create awareness on the existing legal and administrative framework and other instruments on proprietary rights that govern access and benefits sharing	Identify appropriate communication channels	Appropriate communication channels identified	No and type of channels Types of communication messages	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	LT	5.00
		Develop awareness-raising materials	Awareness-raising materials developed	No of targeted audiences No. of campaigns held	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	LT	10.00

⁵Cont – Continuous;

⁶ST – Short Term (Up to 3 years)

⁷MT- Medium Term (up to 5 years)

⁸LT – Long Term (up to 7 Years)

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/Other actors	Time frame (Cont. ⁵ ; ST ⁶ ; MT ⁷ ; LT ⁸)	Cost (Millions KSh)
		Educate communities on benefits of Intellectual Property Rights (IPR) including the value of local indigenous foods, medicine, and other practices and innovations	Communities trained and knowledge enhanced	No. of community groups/individuals disaggregated by gender trained	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	10.00
	4.2.1.2 Build capacity of regulatory institutions and communities to undertake IPR enforcement.	Identify existing governing structures among the communities	Governing structures for IPR in community biodiversity management identified	No. and type of existing community governance structures	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	10.00
		Establish governing structures where these do not exist	Governing structures established and strengthened	No. of communities who establish governing structures No. and type of community governing structures strengthened	Depts. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	10.00

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/Other actors	Time frame (Cont. ⁵ ; ST ⁶ ; MT ⁷ ; LT ⁸)	Cost (Millions KSh)
		Build capacity of institutions and communities on IPR protection	Communities trained and knowledge enhanced	No. of community groups/individuals disaggregated by gender trained	Depts. of Agriculture, Livestock and Fisheries; Culture and Social Services; Education; Land; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; and Communities	Cont.	15.00
	4.2.1.3 Take stock and document potential IPR, practices values and benefits of biodiversity and associated knowledge on existing county biodiversity	Undertake participatory IPR inventory surveys	IPR inventory surveys implemented	No. of surveys reports No. of community groups/individuals disaggregated by gender practicing the interventions	Communities; Depts. Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	5.00
		Develop a database for IPR for Busia	A database for IPR developed	A database for IPR in place	Communities; Depts. Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	10.00
		Identify IP that qualify for Access and Benefit Sharing (ABS) and develop access procedures	IP qualifying for ABS identified and access procedures developed	No. of IP identified for ABS No of ABS approaches developed	Communities; Depts. Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	20.00
4.2.2. Develop administrative frameworks for structured Access	4.2.2.1 Customize the administrative framework on ABS for intra-county,	Take stock of the transboundary resources	Inventory of transboundary resources	Inventories on transboundary resources	Communities; Depts. Of Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	MT	50.00

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/Other actors	Time frame (Cont. ⁵ ; ST ⁶ ; MT ⁷ ; LT ⁸)	Cost (Millions KSh)
and Benefit Sharing (ABS) for trans-boundary and upstream/downstream resources	inter-county and transboundary biodiversity resources and associated knowledge	Engage stakeholders in developing access and benefit sharing mechanisms	Access and benefit sharing mechanisms with stakeholders participation developed	No. of stakeholders engaged No. and type of ABS mechanisms developed	Communities; Depts. of Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	LT	20.00
		Establish access and benefits sharing administrative procedures	Community groups /individuals benefitting from this access an utilization of biodiversity	No. of procedures developed No. of instruments signed No. of community groups /individuals who have benefitted from access an utilization	Communities; Depts. of Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	30.00
	4.2.2.2 Negotiate mutual beneficial agreements with neighbouring counties	Constitute a county negotiating team on ABS	County negotiating team constituted	Functional ABS team	Communities; Depts. Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	20.00
		Build the capacity of the ABS team	ABS team trained and knowledge enhanced	No. of community groups/individuals disaggregated by gender trained	Communities; Depts. Agriculture, Planning and Devolution; WENR; ADSP; KALRO; and KFS	Cont.	10.00
		Conduct negotiations on a needs basis	Beneficial agreements/MOUs negotiated	No. of successful and beneficial agreements/ MOUs negotiated No. of partnerships instruments signed	CECs County Assembly, Private sector, communities and development partners	Cont.	15.00

4.3 Promoting Biodiversity Utilization to enhance nutrition and management of health-related ailments

Policy Issue: High incidences of malnutrition and health related ailments occasioned by low utilization of local biodiversity							
Policy Objective: Enhancing food and nutrition security and wellbeing of communities in Busia County							
Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ⁹ ; ST ¹⁰ ; MT ¹¹ ; LT ¹²)	Cost (KSh Millions)
4.3.1: Influence change in cultural beliefs/practices that inhibit utilization of beneficial biodiversity	4.3.1.1: Promote practices and cultural beliefs that enhance the use and conservation of local biodiversity for food and nutrition	Identify and take stock of practices and cultural beliefs that enhance use and conservation of biodiversity	Benchmark practices and cultural beliefs that enhance use and conservation of biodiversity	Inventory of practices and cultural beliefs that support and or inhibit use and conservation of local biodiversity	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	MT	5.00
		Create awareness on the value and need for conservation and utilization of local biodiversity	County stakeholders sensitized on the value and need for conservation and utilization of local biodiversity	No. of pamphlets and brochures produced No of sensitization fora held per year/sub-county disaggregated by gender	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	Cont.	10.00

⁹ Cont – Continuous;

¹⁰ ST – Short Term (Up to 3 years)

¹¹ MT- Medium Term (up to 5 years)

¹² LT – Long Term (up to 7 Years)

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ⁹ ; ST ¹⁰ ; MT ¹¹ ; LT ¹²)	Cost (KSh Millions)
		Incorporate biodiversity conservation and utilization in education and health programmes	Biodiversity conservation and utilization mainstreamed in education school feeding and community health programmes	No and type of education and health institutions that have incorporated biodiversity utilization conservation into programmes	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	Cont.	2.00
	4.3.1.2: Package and disseminate scientific evidence on nutritional and health values of biodiversity	Collate existing information and establish a database on nutritional and therapeutic value of local biodiversity	Information and knowledge on nutritional and therapeutic value of local biodiversity availed at community resource centres	No of resource centres with information on nutritional and therapeutic value of local biodiversity	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	MT	7.00
		Disseminate information on nutritional and therapeutic value of local biodiversity	Increased awareness of the nutritional and therapeutic value of local biodiversity among stakeholders	No. of community groups/individuals disaggregated by gender utilizing local biodiversity for nutritional and therapeutic purposes	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	Cont.	10.00

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ⁹ ; ST ¹⁰ ; MT ¹¹ ; LT ¹²)	Cost (KSh Millions)
	4.3.1.3: Integrate nutrition education that supports dietary and health choices in learning institutions (schools and tertiary), health services and community biodiversity management programmes	Undertake food composition data analysis with relevant partners on local biodiversity to inform nutrition and health education	A County food composition table containing nutritional data on local biodiversity	Food composition table No. of County institutions routinely utilising the food composition table to inform their programmes	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	Cont.	15.00
		Disseminate information on the nutritional and health values of local biodiversity	Communities with enhanced knowledge on the nutritional and health values of the local biodiversity and utilizing it to inform dietary and health choices	No. of institutions, communities groups/individuals disaggregated by gender utilizing information to inform dietary and health choices	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK, KEMRI; KFS; and Communities	Cont.	11.00
	4.3.1.4: Build partnerships to promote use of biodiversity for enhanced nutrition and food security	Strengthen the coordination framework to synergize the roles and functions of County institutions to support implementation of the policy	A functional and coordinated approach in the implementation and management of biodiversity in the county	A functional Coordination unit	County Government	Cont.	15.00
		Monitor and evaluate the contribution of the utilization of biodiversity to food and nutrition security	Effectively and efficiently implement biodiversity conservation and utilization programmes	M&E Plan Biannual M&E reports	County Government	Cont.	8.00

4.4 Promoting Biodiversity Research and Development

Policy Issue: Low utilization of local biodiversity the is contributing to low socio-economic development

Policy Objective: Enhancing utilization of local biodiversity to stimulate county socio-economic development

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ¹³ ; ST ¹⁴ ; MT ¹⁵ ; LT ¹⁶)	Cost in KSh (Millions)
4.4.1 Research planning and agenda setting to prioritize biodiversity research	4.4.1.1: Establish working partnerships and collaboration with County-based and other research institutions to identify and prioritize research needs	Identify relevant partners and collaborators and undertake joint research needs assessment	Areas for research on biodiversity determined	Report on potential areas for research on biodiversity Action Plan to address the research needs	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; Masinde Muliro University of Science and Technology (MMUST)	MT	1.00

¹³ Cont – Continuous;

¹⁴ ST – Short Term (Up to 3 years)

¹⁵ MT- Medium Term (up to 5 years)

¹⁶ LT – Long Term (up to 7 Years)

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ¹³ ; ST ¹⁴ ; MT ¹⁵ ; LT ¹⁶)	Cost in KSh (Millions)
		Prioritize research agenda for identified biodiversity issues	Priority areas for research identified	Inventory of priority research needs	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; MMUST	ST	10.00
	4.4.1.2: Mobilize resources to support research	Develop collaborative projects addressing County priority research needs	Collaborative projects addressing County priority research needs implemented	No. of research proposal developed and implemented	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; MMUST	Cont	40.00
		Undertake relevant research to deliver technologies/protocols, innovations and management practices	Biodiversity technologies, innovations and management practices (TIMPs) and utilization protocols developed	No. and type of technologies, innovations and management practices	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; MMUST	LT	15.00

Policy Intervention	Strategy	Activities	Target	Objectively Verifiable Indicators (OVIs)	Responsible Agency/ Other actors	Time Frame (Cont. ¹³ ; ST ¹⁴ ; MT ¹⁵ ; LT ¹⁶)	Cost in KSh (Millions)
	4.4.1.3 Disseminate and commercialize developed technologies, innovations and management practices (TIMPs)	Package and disseminate research findings on biodiversity conservation and use	Stakeholders well informed and practicing sustainable biodiversity management	No. of research information products(policy briefs, manuals, pamphlets, books) No. of workshops/trainings and meetings held No. of information products printed and disseminated	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; MMUST	Cont.	50.00
		Establish public-private partnerships to commercialize research findings and products	Up-scale and out-scale best bet TIMPs and business models	No. of successful and beneficial agreements/ instruments negotiated, signed and operationalized No. and type of successful business models	Dept. of Agriculture, Livestock and Fisheries; Culture & Social Services; Education; Lands; Health; DWENR; DRSRS; KALRO; KEMFRI; KEFRI; NMK; KEMRI; KFS; Communities; MMUST	MT	20.00